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MWR-05XP Mobile Phased Array Weather Radar

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The NPS/CIRPAS Weather Radar Project objective is to develop the technology for adding a parallel weather processor capability to tactical military radars and to develop an advanced scientific instrument for investigation of atmospheric phenomena and other various types of research. The payoff to the military will be the integration of current weather data into the tactical radar picture. The payoff to the science community will be the availability of an advanced instrument for investigation of atmospheric phenomena.

Download the Full Brochure [PDF]

Characteristics

- Mechanical scan rate: Up to 30 rpm and sector scanning
- Transmitted Frequency: 9.37 Ghz
- Maximum Power: ~ 16 kW
- Beamwidth: 1.80 (azimuth), 20 (elevation)
- Maximum Unambiguous Velocity: ± 75 m s^{-1}
- Maximum PRF: 10 kHZ max
- Range Resolution: 150 m
- Mobile or Ground Power Configuration
- Field Mill Weather Instrumentation
- Mobile Internet / GPS
- Video Camera System
- VHF Communications

LIDAR System - Installation June 09

Deployments

- 2007 April - June, Severe Storm Tornado Season Oklahoma (NPS/CIRPAS, ProSensing, University of Oklahoma)
- 2007 June - July Department of Energy Arm Project Experiment CLASIC Northern Oklahoma (NPS/CIRPAS and ProSensing)
- 2008 April - June, Severe Storm Tornado Season Oklahoma (NPS/CIRPAS, ProSensing, University of Oklahoma)
- 2009 March, U.S. Army & Missile Defense Command “Integrated Measurements Program (IMP) PAC-3 Flight Test FT 7-2” White Sands Missile Range (WSMR) NM. (NPS/CIRPAS, ProSensing).
- 2009 April - June VORTEX2 Severe Storm Tornado Season Oklahoma (NPS/CIRPAS, ProSensing, University of Oklahoma)

Publications

- “Advanced Weather Surveillance Algorithms and Techniques using a Rapid Scanning X-Band Radar - First Results” 2005 (I. PopStefanija, J.B. Knorr P. Buczynski, R. Bluth)
- “Analysis of Performance Characteristics of the Naval Postgraduate School MWR-05XP-Mobile Weather Radar” Technical Report NPS-EC-05-005 (J.B. Knorr)
- “Weather Radar Equation Correction for Frequency Agile and Phased Array Radars ” IEEE Transaction on Aerospace and Electronic Systems, July 2007 (J.B. Knorr)
- “Experimental Verification of the Weather Radar Equation for Frequency Agile, Phased Array Radar”. Proceedings 54th Tri-Service Radar Symposium 2008(J.B. Knorr, I PopStefanija)
- “Use of a mobile, phased-array, X-Band Doppler radar to study severe convective storms and tornadoes” Proceedings The Fifth European Conference on Radar in Meteorology and Hydrology 2008 (H.Bluestein, R.Tanamachi, J.Houser I.Popstefanija, B.Seeger, R.Bluth, J.B.Knorr)